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## How Math Educators Can Create A Culturally Inclusive Classroom Environment To Motivate Students, Especially Students Of Color, In Learning And Participation

Giathu Vien

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HOW MATH EDUCATORS CAN CREATE A CULTURALLY INCLUSIVE CLASSROOM  
ENVIRONMENT TO MOTIVATE STUDENTS, ESPECIALLY STUDENTS OF COLOR,  
IN LEARNING AND PARTICIPATION

by Giathu U. Vien

A capstone submitted in partial fulfillment of the requirements for the degree of Master of  
Arts in Education.

Hamline University

Saint Paul, Minnesota

August 2020

Capstone Project Facilitator: Trish Harvey  
Content Reviewer: Brittany Schmidtknecht

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## ACKNOWLEDGEMENTS

Con biết 2 chữ cảm ơn không bao giờ là đủ cả vì những gì ba mẹ làm cho con. Con chỉ có thể nói cảm ơn mẹ vì tất cả. Cảm ơn ba mẹ luôn luôn tin tưởng con và lo lắng cho con từng ngày để cho con yên tâm thực hiện được ước mơ trở thành một giáo viên tốt.

Special thanks:

To my family and friends, you guys have supported me every step of the way. Thank you for your continuous encouragement, support, and patience.

To Trish Harvey, Brittany Schmidtknecht, and my capstone groupmates, who helped to shape this capstone. Thank you for taking your time to give me your insights and helpful feedback.

To my partner, Mouhamadou, for being there with me since day 1. Your inspiration kept me going. Thank you for making sure that I stayed on track and celebrated with me from small to big achievements throughout this journey.

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## CHAPTER ONE

### Introduction

Culture is established within an individual's beliefs and perspectives. Welcoming and including other cultures into the classroom creates an open and productive learning environment. "To have a teacher affirm and embrace all cultures, especially those that our society most under-represents or misrepresents, is incredibly powerful. Teachers shape how our children see the world and each other, and it's never too early to begin" (Welcoming Families of Different Cultures, 2006, para. 5). Individual students can participate fully in classes, aim to learn better, and aim to achieve better academic results. Also, students can beneficially experience less stress and have enhanced career prospects.

I started to notice that my students at the charter school I am currently teaching kept asking me, "when am I using quadratic formula or imaginary number in real life?" or "can math be something more relatable?" When the math lessons got theoretical, they became frustrated and the conversation of "I want something I can use now or at least in the near future". In this setting, when students were placed in a culturally inclusive classroom, I witnessed a tremendous difference in student performance. For instance, when I was an AVID (Advancement Via Individual Determination) tutor, the AVID staff and I always started the class with various activities which students got to say hello, count numbers, and phrases from different languages. It made the class welcoming students to share their own opinions freely, to engage, and to learn. The experience in providing students a culturally inclusive classroom environment became a starting point for me in discovering the strategies and the impacts on students. A culturally inclusive classroom is one where students and staff alike recognize, appreciate and capitalize on

diversity so as to enrich the overall learning experience. Fostering a culturally inclusive learning environment encourages all individuals – regardless of age, gender, ethnicity, religious affiliation, socioeconomic status, sexual orientation or political beliefs – to develop personal contacts and effective intercultural skills (Barker et al., 2009).

Both personal education and teaching experiences ignited my interest to conduct this research project. This chapter introduces my experiences being with and without a culturally inclusive environment. Then, I explain the root of my interest in knowing about a culturally inclusive environment. Finally, I state my main motivations and purposes of covering, *how can math educators create a culturally inclusive classroom environment to motivate students, especially students of color, in learning and participation?*

## **Background**

I immigrated to the U.S. when I was almost sixteen years old and attended a suburban high school where 82% were white. It was the hardest time for me because I struggled with cultural and language barriers. I felt like an outsider throughout my three years in high school because the lessons in class were not relatable to my personal experience. I thought it was fine to be lost because I came from another country and it was normal if things were not familiar to me. I accepted the facts and kept trying to fit in until I graduated. The truth was that I was not able to fit in at all. One of the experiences I will never forget is when I learned probability. I was an A grade student in math until I was introduced with probability. At first, I thought I did not understand the meaning of the words. Although I translated and got help from an ESL teacher, I was not able to solve it by myself because I could not relate to the problem in order to understand it. No matter how hard I tried, it still left me with frustration of solving the problems without knowing why and how it benefited me in real life. The examples were used surrounding white



American culture. On the other hand, the only place I felt welcomed and included was ESL classes because I could openly talk about my culture, include my culture and traditions into my learning, and share it with other classmates. People not only knew my country from the war, but they learned about my ancestor veneration and worship, the respect for community and family values, and manual labor religious belief.

In 10 years, I have received college education and practiced teaching in suburban areas. My teaching style somehow is influenced by white-centric curriculum. After student teaching, I received a job offer at a charter school in an urban area where 80% of the population is Black. Again, I faced a cultural shock. When I was in school, I remember I only needed to worry about school and getting good grades. Yet, the majority of my students have to worry about money, social pressure from people who do not see education as a means to better their life, domestic issues, systemic issues relating to funding and transportation, and gang violence. They indeed want school to help them prepare to overcome those obstacles during their high school years and post graduation. Although students have been trying, like I tried when I was in high school dealing with probability, they have checked out from time to time or skipped classes because the standards are white-centric focused and abstract. That leads to making them think that math is useless and they do not see when and where they are going to apply it. The standards do not seem to fit in with the school where students of color want to feel that they are getting ready for their future. Therefore, they do not put effort into starting doing work on their own. If they ever did, they would not want to fix it and just give up on it.

## **The Roots of My Interest**

In order to feel a connection to math, it took me 10 years to adapt to American culture. I am then able to put myself into the problem as a real life situation that I have to face. I am now able to use my problem-solving and logical skills to get the work done. Yet, I do not want my students waiting to realize or be able to do it until they graduate from high school and college like me. I want to create an environment that I wish the teacher in my high school could have done so I felt welcomed and did not want to run away from math. I am determined and passionate to step out of my comfort zone to make a difference.

## **Motivations and Purpose**

My transition from suburban to urban school has opened my eyes. The school cultures are different and beyond my expectations, but I started to have more empathy and patience for these kids who suffer so much due to limited resources and support. I do not want to use the excuse of the standards to stop me from creating my own way to engage students in learning. By creating a culturally inclusive classroom environment, it will help me understand my students and build a great relationship not only from in class but also outside of class. That is why I wanted to do a project on the Pythagorean Theorem as an example to show how to make a math classroom culturally inclusive for students because I believe they should be encouraged to be active questioners, doers, and problem-solvers who produce knowledge that is both theoretical and practical.

## **Conclusion**

In this chapter, I have explained the origin and development of my interest in creating a culturally inclusive classroom environment. Here, I also justified the rationale for my passion in the topic. In chapter two, I will explore multiple research studies about

the culturally inclusive classroom in order to answer the question, *How can math educators create a culturally inclusive classroom environment to motivate students, especially students of color, in learning and participation?* I will begin with defining a culturally inclusive environment within diversity and its factors. I will then categorize various strategies and address the effectiveness with students of color. Finally, I will create guidelines for educators that will help them foster a culturally inclusive environment in their own classroom. This chapter will be followed by Chapter Three where I describe in detail my research methods and steps in my presentation.

## CHAPTER TWO

### Literature Review

#### Introduction

Creating a culturally inclusive environment could be challenging in terms of being open to new perspectives in the classroom, but it is not impossible because we as educators all want to boost our students' learning to reach their potentials. This chapter reviews literature to support my research question: *How can math educators create a culturally inclusive classroom environment to motivate students, especially students of color, in learning and participation?* in order for me to create a five-day lesson plan and presentation on Pythagorean Theorem.

This chapter first shows how cultural inclusivity can motivate student learning. It shows how diversified teaching can create a more inclusive environment. Also, it addresses and supports the needs of people from different cultures that value their unique contributions. Then, the chapter will go through the important factors such as interaction, student motivation, and social justice that impact students in learning and participation. The "Interaction" section will list the characteristics of classes with low and high student-teacher interaction and provide how teacher-student interaction affects a student's social, emotional, and cognitive development as well as their mental well-being. The second part of the section will provide an overview of how interaction impacts teachers' interpersonal and professional skills. The "Student Motivation" part explains the two different types of motivation: intrinsic and extrinsic and its effects. Then, it will provide the factors that influence students' motivation in education. Lastly, the "Social Justice" section explores the systemic obstacles that affect the student's ability to

feel included and learn. We will also unravel the systemic issues that prevent scholarship in minority groups. The first part will explore the concept of inclusion policies in social injustice. The second part will explore the methods for school systems to deal with and improve the conditions of students affected by social injustice.

### **Culturally Inclusive Environment**

A culturally inclusive environment is a space that acknowledges the cultural diversity and sensitivities of the different people occupying the space (Quaye & Harper, 2007). Culturally inclusive teaching acknowledges student's diversity and the need to find relevant connections between themselves with the subject matter and task they are asked to perform (Quaye & Harper, 2007; Samuels, 2014). Yet, some schools have a limited understanding of the cultures other than their own.

Diversity is an important factor in urban and diverse learning environments. It presents opportunities in overlapping institutional goals with matters of representation, practices, curricular adaptation, improves the scholarship of minorities, and methods of pedagogy (Quaye & Harper, 2007). Teachers play a key role in realizing the nation of inclusive education. The attitude of teachers involved in the planning and implementation of an inclusive classroom is key to its success (Stafford & Green, 1996). Therefore, the main factor in the performance of inclusion is the attitude of teachers towards their students. Thus, it is essential to evaluate those elements during professional development that help teachers to reflect on and develop their positive attitudes towards inclusion (Leatherman & Niemeyer, 2005).

Culturally inclusive environment attributes the inclusive values of positive attitude diversity, collaboration, installation of overcoming barriers to inclusion. Also they interfere with inclusion, and therefore, the creation of a school community is only part of the

assessment of the inclusiveness of education (Montgomery, 2001). In addition, school is required to be responsible for the diversity of students, satisfying each and every one and inclusive practice is defined as the axis of the development of learning practices, reflecting the inclusive orientation of culture and school policies (Anderson et al., 2014; Quaye & Harper, 2007). In making inclusive schools, Anderson et al. (2014) emphasized that the role of teamwork throughout schools cannot be lacking - from administration to each staff member, furthermore, the value of building partnerships with parents and the local community. It is clear that all three aspects of assessing school inclusivity (inclusive active culture, politics and practice) are closely interrelated, knitted and mutually conditioned (Erickson, 1990). Andrews (2006) pointed out that the skill of educators applying teaching methods that allow for the needs of each student and work successfully in conditions of diversity will have a positive effect on the formation of the positive attitude of the teacher towards value diversity (part of an inclusive culture); this attitude will facilitate the search for more diverse teaching methods (p. 6). Therefore, classroom teachers should actively collaborate with the special education coordinator because special educational practices offer the differentiation of learning, i.e. applying diverse teaching styles and the ability to use the skills of specialists (Montgomery, 2001). It is important to find a way of teaching that a student can ensure success in learning by using their resistance to visual rather than oral stimuli.

It is important to also focus on silent cultural components, such as attitudes and behavioral norms varying from available for observation to inaccessible to students (Park, 2000). The observed characteristics of the classroom are found in culture, for example, the curriculum, class content, pedagogy, and classroom practices (Anderson et al., 2014; Andrews, 2006; Quaye & Harper, 2007). In order to have a deep foundation of

culture, an educator needs to understand the values and relationships that underlie the standards of conduct in school by having focal observations and interactions with other school staff members and students (Anderson et al., 2014). In this way, teachers can penetrate deep into the non-mainstream culture of the school, at its core assumptions that unite it. It is important to take into account the interaction of school goals as an image organization and its values as an inclusive active community (Zollers et al., 1999). Therefore, understanding the definition and the benefits of how a culturally inclusive classroom impacts on the students' learning and participation at a deeper level could help the educators bring out what beliefs are important to our students.

### **Interactions**

Teacher-student interaction is an important factor in developing the students' academic self-concept and enhancing their enthusiasm and success. It shows a significant impact on classroom management and affects students' learning and growth (Bernstein-Yamashiro et al., 2013; Solheim et al., 2018). The main criterion for the effectiveness of teacher work is the academic success of students (Greenberg et al. 2003; Zins et al. 2007; Bernstein-Yamashiro et. al 2013). This indicator is oriented towards a functional role plan of interaction between teacher and student (Abry et al., 2013). By creating a student-centered classroom and establishing student-student interaction, effective leadership uses satisfaction with group membership, including level student satisfaction with various aspects of life in the classroom is interpreted as a success indicator of the teacher. Petrushikhina (2013) mentioned that one of the results of an active interaction between a teacher and students is the formation of a certain level of authority of the teacher.

In socio-psychological research, when students are more comfortable in taking a specific role in the classroom, the leadership shows a positive relationship between various parameters of student satisfaction and the degree of authority of the teacher (Petrushikhina, 2013). In this way, the level of authority may also indicate a performance teacher. One of the most important pedagogical tasks is to educate the team in the classroom (Abry et al., 2013). Therefore, an indicator of classroom performance leadership uses various characteristics of the team, for example, cohesion, responsibility, discipline, etc. (Solheim et al., 2018). Efficiency class leadership was determined by the level of self-esteem of the class. Students assessed the degree of development of socio-psychological qualities as cohesion, discipline, mutual responsibility, cooperation, mutual assistance, etc. (Petrushikhina, 2013).

As characteristics of the personality and activities of the teacher in research, Pianta et al. (2012) and Solheim et al. (2018) identified the features of the individual interaction of the teacher with students in instrumental, motivational and emotional spheres, manifestations of various types, attitudes towards students, leadership style, behavioral strategies in conflict situations. The authority of the teacher and satisfaction with relations depend on the individual characteristics of the interaction instrumental sphere - from the knowledge of the strengths and weaknesses of the student as a student's ability to predict academic achievement and carefully plan work with the student (Pianta & Hamre, 2009). Teachers implement strategies in conflict situations with students' cooperation, adaptation, and compromise, seek cooperation with students, organize their activities in accordance with the needs of students (Abry et al., 2013). The significance of this makes them more effective: students in their classes are more satisfied with various aspects of school life, class self-esteem by most parameters is



higher, and the authority of the teacher among students (Bernstein-Yamashiro et. al., 2013). The analysis parameters were leadership style of the classroom team, features of individual interaction between class teacher and students, the severity of various settings teacher with students (Abry et al., 2013).

The factorization revealed two main factors that reflect the most significant from the activity of the teacher. Petrushikhina (2013) claimed the first factor is "caring for students" The greatest factor loads included the following aspects of activity class teacher: lack of a hidden negative attitude, concern for students, sensitivity in relations with students, taking into account the views of students, lack of functional installation, discussion of solutions, the desire to be close to students, lack of a neutral attitude, the justice of the teacher, the ability to give advice, the ability cheer up (Bernstein-Yamashiro et. al., 2013). The second factor is motivational. It was composed of the following points activities of the class teacher: analysis of student behavior, setting super goals, exactingness, ability to motivate to work with full dedication, development of initiative students (Solheim et al., 2018). Hence, the first factor characterizes the activity of the teacher in the interpersonal sphere of group activity, and the second - in the instrumental.

The interactions part is the key to creating the culturally inclusive classroom and this starts with relationships and respect from the teacher for the student. This respect is for their background and culture and if the environment (classroom) is beautiful but the interactions are terrible the whole relationship is out the window. Also, the teacher needs to be open and willing to learn from the student when it comes to culture. Therefore, generalized performance is characterized by two types of relationships: relationships between students and relationships with the class teacher. Most pedagogical

relationships with the class teacher are affected, and relationships between students are relatively inaccessible to the influence of educators. Petrushikhina (2013) noted that a consequence of a more detailed interaction class teacher in the dyad *teacher-student* than in the system *teacher-whole class*. This can be interpreted as an imperfection of pedagogical technologies. Classroom management as a process interaction involves students' behavior, time and attention in the classroom (Emmer & Stough, 2001). The subject of the study was the readiness of the class teacher in accepting student impacts. Petrushikhina (2013) revealed four specific manifestations of this readiness, increasing the effectiveness of the interaction process teacher and students: 1) the readiness of the class teacher to make under the influence high school students adequate changes in their behavior; 2) readiness the teacher to treat high school students as adults who can objectively evaluate the personal and behavioral characteristics of the teacher; 3) the willingness of the teacher to constant mutual enrichment in the process of communication with high school students; 4) satisfaction of the class teacher with their relations with the student collected. Solheim et al. (2018) claimed that higher classroom readiness the leader to accept the influence of high school students, the stronger teacher's influence on student behavior relations between classmates, professional self-determination of high school students, the formation of moral values of students, characterological features of student's relationship with school teachers, the attitude of students to school in general. At the same time, the effectiveness of classroom leadership is also the willingness of the teacher to change under the influence of students their characterological qualities, beliefs, habits, ideas; pedagogical abilities (Manke, 2013).

High self-esteem of class teachers, lack of ability to decentralize in pedagogical communication, hinder optimization interactions between teachers and students reinforce their attributive errors. Petrushikhina (2013) showed the influence of attributive errors on teachers on the effectiveness of classroom leadership. In terms of influencing the effectiveness of classroom leadership, the teacher's attribution of student failure is more important, as the representation in its characteristics of pedagogical activity encourages teachers to correct their activity by the characteristics and needs of students (Solheim et al., 2018). At the same time, Manke (2013) defined parental control is the cause of student performance. It has an extremely adverse effect on pedagogical activity, because it reduces the level of manifestation of the value contribution teacher and, as a consequence, its effectiveness. Therefore, to achieve high student satisfaction with various aspects of life in the classroom and high self-esteem of the class, it is important not to attribute the reasons conflicts to the student's factor and that the authority of the teacher is higher in order to find the reasons conflicts in the flaws inherent in teacher's personality and activities (Petrushikhina, 2013; Manke, 2013).

### **Student Motivation**

Education is designed to help an individual develop, giving students the means and opportunities for reanalysis of their creative potential. When the teacher-student relationship is established, motivation is an internal impulse that brings us to complete an action. Without motivation, there is no action. Motivation may come from a student's interest, or it may come out of necessity. Student motivation both typically and naturally has to do with the student's desire to participate in the learning process (Dornyei & Ottó, 1998).

Sansone and Harackiewicz (2000) defined that intrinsic motivation is an interest in educational morale and extrinsic motivation is to receive various kinds of rewards. It is an external achievement when students complete an activity in order to help students hold their goals. Intrinsic and extrinsic motivations are directly proportional. Sansone and Harackiewicz (2000) found that, “when the extrinsic reward is no longer available, individuals no longer have sufficient intrinsic reasons to engage the behavior” (p. 2). The basic needs of intrinsic motivation are: in self-determination and competence, and the relation to others by people (Sansone & Harackiewicz, 2000; Usher & Kober, 2012). The need for self-determination implies a student’s desire to understand themselves and the motives of their actions. The desire to feel their knowledge and professionalism to something is expressed in the need to be competent. The need for relationships implies the desire to establish close and trusting relationships with others, and feel accepted (Vitto, 2003).

The motivation for learning implies a set of certain attitudes and beliefs about educational and professional activities. The psychological characteristics of students play an important role in setting educational tasks since there is a significant difference between those for whom they are characterized by gaining approval, praise, and those who are more focused on acquiring new knowledge and skills (Hancock, 1995; Panisoara et al., 2015). Negative motivation affects the learning process, therefore, it is very important to form and maintain positive learning motivation (Vitto, 2003). As a result of a negative experience, if the student has an opinion about their failure, then in the future, when difficult tasks arise, their attention will not be entirely concentrated on their resolution, because they will experience anxiety, thinking about their failures. Therefore, the student’s opinion about the efforts made to complete a task will affect their

assessment of the final result because if they feel that the activity is controlled by themselves, they will make further attempts despite previous failures (Usher & Kober, 2012). In the formation of motivation favorable for learning, caution is necessary. Students with pronounced cognitive activity to a lesser extent than other students who need approval and other incentives; it is important to maintain their interest (Hancock, 1995). The student, having completed a specific task, will rely on feedback. Therefore, joint planning of activities, as well as analysis of its results, is advisable to consider as one of the possible options for the formation of motivation (Dornyei & Ottó, 1998).

Extrinsic motivation is supplementary of intrinsic motivation because external rewards (verbal reward, for example) influence a sense of competence that can contribute to the development of internal motivation (Sansone & Harackiewicz, 2000). Several studies (Domenech & Gómez, 2014; Panisoara et al., 2015) confirmed the influence of the features of verbal communication between teachers and students both on student motivation and the educational process as a whole. Encouragement will be the determining factor in the impact on educational motivation individuals, while the promotion itself will primarily carry out information or a controlling function (Sansone & Harackiewicz, 2000). In addition, the learning process plays an important role by having students set their personal goals (Usher & Kober, 2012). The educational process will be easier for the student in the absence of contradictions between personal priorities and learning objectives. During the educational process, motivation can both develop as a result of the internalization of new educational goals, effective interaction with the environment (Vitto, 2003). Based on the relationship with the students, educators can be able to identify what type of motivations can fit with their learning style and what steps educators can take in order to exploit their potential.

## **Social Justice**

The history of teaching is associated with a history of human rights and social justice issues. Matters relating to the distribution of wealth, social opportunities and privileges affect the families and collaterally the students from different cultural backgrounds. In order to present the content of the concept of inclusion, it is necessary to have an idea about new inclusion policies; it is important to pay attention to the context of appearance, in which various approaches to interpretations of social justice (Dahl et al., 2004). The article also confirmed that economic inequality is one of the main reasons for social exclusion. The inclusion policy needs to be focused on the redistribution of economic resources that support the formation of vulnerable groups and for their social protection (Brighouse, 2003; North, 2006). Another reason is the non-recognition of identity socio-culturally distinct groups (ethnic, racial, gender, age, etc.) and various groups of people with disabilities (North, 2006; Theoharis, 2007). The equal recognition of the differing identities of these groups along with the dominant cultural group requires it to take place (Cambron-McCabe & McCarthy, 2005). Different approaches in relation to these competing implementations of inclusion policies is from search balance between the compensation of economic inequality and unequal recognition to building the distribution of resources towards compensation for unequal recognition (North, 2006).

Another important concept essential to understanding the origins of the concept of inclusion is the concept of equality, which also has a number of different interpretations. It can be either equality of opportunity, or equality of outcome comrade, and in each case, there is a strong and a weak version of interpretation (Brighouse, 2003). In the case of political equal opportunity and probability of persistent source of

inequality, children in the strength of belonging to different families have unequal access to economic, social and cultural goods and, as a result, different social and cultural capital. Cambron-McCabe and McCarthy (2005) emphasized that a strong equal opportunity policy requires compensation for the source of inequality. Another radical approach is equal outcome policy to impede inequality for people from different social background groups.

Given these different interpretations of social fairness and equality, North (2006) highlighted three types of understanding of inclusion or three types of political-discourse on inclusion: 1) discourse of redistribution, 2) discourse of a morally disadvantaged class (moral underclass discourse), and 3) discourse of social inclusion. In the first case, Dahl et al. (2004) stated that the cause of social exclusion is considered tangible: the situation of families of students and the way they include redistribution of funds in their favor. In the second case, the main reason for exclusion is the level of culture of the excluded social group that interferes with the implementation established social norms by them and contributes to their inclusion (Byrne, 2005). Means of promoting inclusion, in this case, is a change in their relationship to themselves and society, as well as their inherent culture. In the third case, the main reason for exclusion is a lack of appropriate labor market jobs, and the way to counter exclusion is to encourage an excluded individual to participate in work to be performed (Byrne, 2005). There is inter liaison of all three types of inclusion discourse, dependence interpretations of inclusion and exclusion, as well as communication between the discourses of redistribution and recognition identity (Dahl et al., 2004).

North (2006) noted that Fraser's model describes a combination of equality of opportunity, process and outcome, and also takes into account the problem of equal

acceptance of resources and redistribution of resources in favor of vulnerability related groups. It is worth noting when the school considers fair recognition, the identity of various social groups, and individuals who may be guided by various new ideas about the desired good in life, and adjusts the long and short term goals (Brighouse, 2003). The school administrators and teachers could develop the four components of reflective consciousness as an approach to lead toward social justice from the combined research of Scheurich and Skela (2003), Theoharis (2007), and Rapp (2002). The first is what Scheurich and Skela (2003) believed that, “learning to believe the dream is possible” (p. 9). They further highlighted the second belief that, “models of equity and justice in practice” (p. 2). Theoharis (2007) stated the third component of the importance of, “deepening administrators’ knowledge of self” (p. 3) “rebellious, oppositional imaginations” (Rapp, 2002, p. 226). The approach needs to pass on to the students by bringing the implications into class content (Bogotch, 2000). It would benefit students as future leaders to “develop their resistance and resilience as they face barriers to social justice” (Theoharis, 2007). Educators need to be aware of how the education system got to the place it is today, pay attention to current events that impact our students of different cultures, and keep an equity lens at all times. Students bring culture to the classroom; we as educators need to acknowledge it, show them other cultures, and celebrate differences. Students may not notice the culture differences but it is our job as educators to purposefully draw attention to cultural aspects in and outside of the classroom.

## **Conclusion**

Chapter two provided a review of literature on the question, *How can math educators create a culturally inclusive environment to motivate students, especially*



*students of color, in learning and participation?* This chapter offered the overview of a culturally inclusive environment and how important it is for students, especially students of color. It also addresses the three factors that place emphasis on interaction, student motivation, and social justice. Each factor highlighted the key elements in terms of creating a culturally inclusive classroom and also provided suggestions to enhance students' learning and participation.

Creating a culturally inclusive classroom environment is the topic that many researchers have investigated and worked hard in finding the bottom line and a variety of strategies to make students feel motivated, related, and encouraged in learning. Hence, it is important that each and every educator connects and helps students develop individually and effective cross-cultural skills. Many studies have shown that having a culturally inclusive classroom has positive short-term and long-term effects for all students. Students are likely to stay in school more and believe that they are able to gain and develop the skills from their classes. The researches also show that students feel more comfortable and more tolerant of differences not only with their peers but also with their teachers. In contrast, students start misbehaving and checking out from one class to another when they feel unwelcome, less supportive, and less engaged. Moreover, instruction alone is not enough to help students master the critical-thinking and problem-solving skills. At the same time, when educators make the assumption that students are unable to contribute great ideas, educators already set low expectations on those students. When educators do not believe in the intelligence of the students, they will not believe in their abilities.

Yet, when educators want students to learn, educators should ask hard questions knowing that they can give insightful answers, they can provide intelligent answers. Part

of our role as educators is to prove to our students that they are smart and to give them the rewarding, gratifying experience of communicating their intelligence. Educators should take into account using the students to explain something positive that applies to the lesson. It will elevate a student and get him/her to involve more in the class, as well as motivate other students to participate positively.

Furthermore, establishing a multicultural perspective is a link among critical reflection in the sense that students learn to think in terms of diversity and inclusion that can be applied to the real world. It goes further than the simplistic implementation of cultural lesson plans and interventions. When students are motivated and validated in their own cultural identities, they will be driven to advocate for change on a broader scale as they grow up and mature into their adulthood. Whether addressing a specific topic, creating interactive projects, or contributing to the community, students will be able to use the critical thinking skills and trust they have cultivated through culturally inclusiveness for the better.

This research has been conducted in the context of a curriculum development project for educators who want to adjust their lessons more culturally inclusive. This project will be explained in detail in the next chapter as well as its purpose and rationale by utilizing the research findings. Also, I will take a topic of my content to innovate my lessons in providing my students a culturally inclusive classroom environment. Finally, I will explain the audience and setting of the project.

## CHAPTER THREE

### Project Description

#### Introduction

In chapter one, the experience in providing students a culturally inclusive environment became a starting point for me in discovering the strategies and the impacts on students. Being a secondary teacher in an urban area pushes me more to explore the answer to the question: *How can educators create a culturally inclusive classroom environment to motivate students, especially students of color, in learning and participation?* I, then, investigated different factors about the culturally inclusive classroom such as interaction, student motivation, and social justice from multiple research studies in chapter two. Therefore, in this chapter, I will create a five-day lesson plan on the Pythagorean theorem as a sample lesson to show math educators how to create supportive and motivational lessons for students. I will have the presentation followed by the extensive lesson plan which innovates a framework for educators to help students feel related and encouraged to participate and learn in the classroom.

#### Chapter Overview

The purpose of this project is to provide the strategies and a lesson plan sample for educators to create a culturally inclusive classroom environment with their students. While there are a number of recommended strategies out there through research, a few strategies (Barker et al., 2009) were selected and formed in a Venn diagram “characterized by cultural inclusivity, mutual respect, and genuine appreciation of

diversity” (p. 1). Along with the strategies, the lesson plan sample could help educators visualize it better in terms of how to apply the strategies effectively.

### **Framework**

This project used an intrinsic motivational framework (Dornyei & Ottó, 1998). It is a model of culturally responsive teaching based on intrinsic motivation theories. In mathematics, the concept of culturally responsive teaching as ethnomathematics has been conceptualized (D'Ambrosio, 1997). Ortiz-Franco (2005) defined it as the study of mathematics that acknowledges and incorporates the culture in which mathematics occurs or the way different cultures "go about the tasks of classifying, ordering, counting, measuring or mathematizing their world" (p. 71). Within this framework, pedagogical alignment, the collaboration of teaching methods to provide optimum consistent impact, is important. The more harmonious the teaching components, the more likely they can elicit, inspire and maintain intrinsic motivation. The framework names four motivational factors that are continually generated or improved by the teachers and students. They are: a) *establishing inclusion* - creating a learning environment where students and teachers feel valued and connected, b) *developing attitude* - building a beneficial desire to learn through personal significance and preference., c) *enhancing meaning* - developing stimulating, reflective learning opportunities that provide insights and values for students, d) *engendering competence* - creating an understanding that students are productive in learning what they enjoy (Dornyei & Ottó, 1998, Sansone & Harackiewicz, 2000). These conditions are critical for the development of intrinsic motivation. They are prone to different cultures. They work in coordination as they impact teachers and students, and they occur in a moment as well as over time.

## **Project Description**

This project is designed as a topic on Pythagorean theorem as a sample lesson to show math educators how to create supportive and motivational lessons for students. In this project, I have the presentation followed by the lesson plan. In the presentation, the slides have the contents and instructions for warm-ups, group and pair activities, and exit tickets. In the lesson plan, I especially included the teaching strategies and methods that I have used, and motivations in order to create a culturally inclusive classroom environment. Also, I explained in detail what each part is and what goes in it.

## **Rationale**

### **Curriculum Development Project**

I chose curriculum development because it assists educators in developing individualized approaches and materials necessary to make them effective. Curriculum development is defined as the step by step process often used to create positive adjustments in the classes. It allows flexibility and promotes innovation and growth within the overall framework. The educator plays a significant role in the curriculum development process and any effort because they have the experiences, knowledge and competencies. Carl (2009) suggested that educators need to create lesson plans within the framework because the goal is to implement the curriculum to help students develop interests and skills in their interest area or topic and also meet their needs. Curriculum development can be challenging, therefore the involvement of educators who are directly involved in student instruction is a fundamental part of effective CD (Johnson, 2001). Consequently, the educator is an important element in the effectiveness of curriculum development through the phases of involvement and assessment.

With that being said, I provided the educators that lesson plans as an example of how I could make my classroom become a culturally inclusive environment and help my students enhance their learning and participation.

### **Implementation**

Some educators have limited understanding of cultures besides their own and the risk that this deficiency will significantly impact the students' motivation to be effective learners. Educators should therefore critically evaluate their relationship with students and their understanding of students' diversity (Bromley, 1998; Patton, 1998). Diversity self-assessment is one method that teachers can use to evaluate their beliefs and assumptions in a reflective and potentially successful way (see Figure 1) (Montgomery, 2001, p.4).

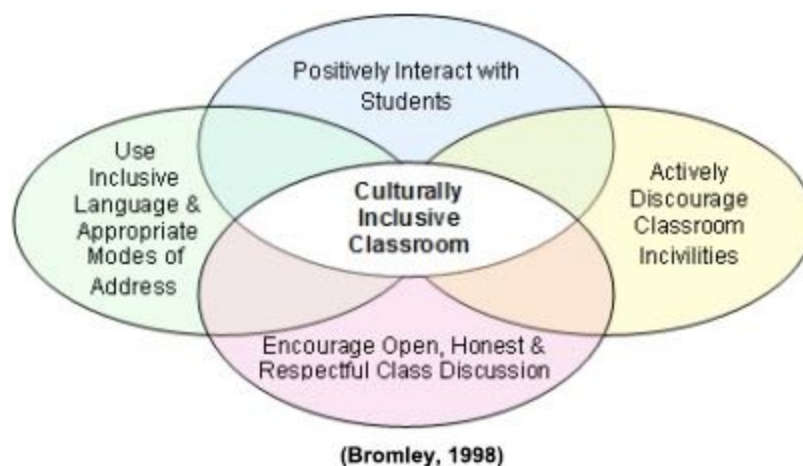
### **Figure 1. Diversity Self-Assessment**

- What is my definition of diversity?
- Do the children in my classroom and school come from diverse cultural backgrounds?
- What are my perceptions of students from different racial or ethnic groups? With language or dialects different from mine? With special needs?
- What are the sources of these perceptions (e.g., friends, relatives, television, movies)?
- How do I respond to my students, based on these perceptions?
- Have I experienced others' making assumptions about me based on my membership in a specific group? How did I feel?
- What steps do I need to take to learn about the students from diverse backgrounds in my school and classroom?
- How often do social relationships develop among students from different racial or ethnic backgrounds in my classroom and in the school? What is the nature of these relationships?
- In what ways do I make my instructional program responsive to the needs of the diverse groups in my classroom?
- What kinds of information, skills, and resources do I need to acquire to effectively teach from a multicultural perspective?
- In what ways do I collaborate with other educators, family members, and community groups to address the needs of all my students?

*Source:* Adapted from Bromley (1998).

When answering these self-assessment questions, I was honest and took time to carefully answer. Then, I reflected on my responses and made important decisions on how to incorporate diversity in a positive manner and thereby build a culturally inclusive classroom environment that relates to my students' needs.

**Figure 2. Recommended strategies to assist with creating a culturally inclusive classroom**



When creating my lesson plans and the presentation, I was made sure that I followed the recommended strategies because it helped to make my classroom more engaging in learning activities.

### **Audiences and Settings**

I have experience teaching high school students in a multi-age setting. For this project, my intended audience was high school students in a math classroom setting. When I created this topic, I followed Minnesota Academic Standards in Mathematics. While I designed this topic for the high school students, my hope was that other teachers in any subject who want to create a culturally inclusive environment in their classroom are able to utilize the methods and strategies I used for this topic.

My school is a 6-12 charter school in an urban area. We are a multi-age school because the students are scheduled based on the subjects and due to the size of enrollment. My school provides free breakfast and lunch for all students because students are mostly from low-income families. Also, students of color and immigrants



make up more than  $\frac{3}{4}$  of the school population. It is important to note the demographics when considering the setting.

### **Timeline**

I completed Chapter One, Two, and Three in the spring of 2020. I continued editing it in the summer of 2020 while implementing the project and writing Chapter Four. The lesson plans and presentation were made in the summer of 2020 and ready to present in the same time frame. The project and paper will be available publicly in the fall of 2020.

### **Conclusion**

Chapter Three provided the project in detail and explained the work that will be taken to help me answer the question: *How can educators create a culturally inclusive classroom environment to motivate students, especially students of color, in learning and participation?* First, I provided a brief summary of the project framework which shaped my lesson plans on Pythagorean theorem. Then, I described my project including the rationale and implementation. I also outlined the audience and setting briefly. Finally, my timeline was given to track on the time frame of the project and materials.

In the next chapter, I will focus on the reflection throughout this process. I will share my takeaways from this project journey and any changes I would want to make in order to use it in future lessons and also helping other educators apply the strategies in an easier way.

## CHAPTER FOUR

### Conclusions

#### Chapter Overview

As a child of immigrants, I know how difficult it is to integrate a new culture and to share my culture with others. Also, the pressure of our parents and community expects us to do better in school and use the knowledge to apply in the real world. Therefore, I understand where my students come from and things they have to deal with in everyday life. I don't want my students to go through cultural problems like I did because it was not a great feeling to have. As a teacher of color, my mission is to make sure that my students could freely bring their own cultures to my classroom, especially to math lessons. From there, students are able to relate and feel that they matter and their cultures are recognized; they start to be more curious and interested in school work. That is why I am here to find the solutions of *how math educators can create a culturally inclusive environment classroom to motivate students, especially students of color, in learning and participation?* In this chapter, I will share my research journey and reflect on my project experience of creating a Pythagorean theorem lesson plan including my future plan. I will briefly summarize my research experience and provide what parts of the literature review stand out to me the most. Lastly, I will recap the main emphasis and learnings along with the downside and recommendations/suggestions.

#### Research Experience

Oftentimes math is seen as a subject in school that is not applicable to real life situations. In order to show how math can be used in the real world, I started doing more projects related to students' lives which increased their interest in math. On top of that, I

always want to deliver math lessons in the most effective ways that could reach students' potentials. Therefore, I found the three main components that address and support the needs of the students from different cultures. They also bring the value of their unique contributions.

In order to create a culturally inclusive environment classroom, interaction between teachers and students is the first starting point in creating a culturally inclusive classroom where I can build a mutual relationship, trust, and respect with my students. It shows a significant impact on classroom management and affects students' learning and growth (Bernstein-Yamashiro et al., 2013; Solheim et al., 2018). I learned that taking time getting to know my students in the beginning will help my students to be more open and willing to share their personal experiences and perspectives. It helps me plan my lessons better with activities that students can interact with the teacher and within their classmates. From there, students can take control and develop their leadership skills that make the classroom more student-centered and teacher as a facilitator. When the teacher-student relationship is established, it is easier for teachers to know how to motivate students in an effective way because motivation may come from a student's interest, or it may come out of necessity. Student motivation both typically and naturally has to do with the student's desire to participate in the learning process (Dornyei & Ottó, 1998). I did not know before that there were two types of motivation. There are intrinsic and extrinsic motivations. I was surprised that the usage of each type would give a different outcome depending on the students' needs and characteristics. The researchers have recommended that teachers should use intrinsic motivation more than extrinsic because "when the extrinsic reward is no longer available, individuals no longer have sufficient intrinsic reasons to engage the behavior" (Sansone & Harackiewicz,

2000, p. 2). On the other hand, it is beneficial to use extrinsic motivation for verbal rewards. Several studies (Domenech & Gómez, 2014; Panisoara et al., 2015) confirmed the influence of the features of verbal communication between teachers and students both on student motivation and the educational process as a whole. Throughout the interaction and motivation, teachers need to be aware of current events that may affect students culturally in both positive and negative ways. Therefore, social justice problems through math lessons need to be added in the “models of equity and justice in practice” (Scheurich & Skela, 2003, p. 2) because it makes students feel understood and supported. The discussions could be sensitive to some students; we as educators can help to create an open, safe, non-judgmental environment space for them where they can contribute and learn different cultural aspects.

After doing my literature review, I found out that the three factors are connected and embraced in establishing a culturally inclusive environment. Interaction is the most crucial component which links motivation and social justice because students and teachers both need to have the time in order to build the trust space between them. Without interaction, there is no motivation. Without interaction, it is very difficult to have vulnerable conversations with students.

### **Project Limitations**

Throughout the whole project, there are several limitations that I would like to address. Although the project has a well-established outline, it is only targeted to a certain audience because every classroom has specific needs and supports. When I created the lesson plan on the Pythagorean theorem, I knew my students who like to be active, love rap music and hands-on projects. I tended to head my direction the way that could motivate my students and help them stay interested. Hence, the project cannot be

generalized for all math educators to use, but I believe it could be a great sample to review and follow the key components.

Before conducting the project, I figured out that there were limited materials out there for students of color. Also, the lack of research conducted about math education and a culturally inclusive environment together limited my original intent to create more samples of some decent topics or units for Algebra or Geometry. It was very difficult to plan and find resources and activities that are related to my students' backgrounds and experiences. The Pythagorean theorem was one of the few topics that I was able to reframe the content objectives and rewrite my own tasks.

Because each topic requires revisions, time becomes the worst enemy. I did not have enough time to create another lesson plan sample for an algebra topic that other math educators can have each example for each class. I could not be able to take my time to create and innovate at this moment because of the given deadlines. Thus, due to the time constraint, I cannot have both quality and quantity work, but I at least focused on one quality topic.

### **Future Work Plan**

For the Pythagorean theorem topic, I will use the lesson plan and presentation in this project to teach in my future geometry class. I will continue to revise my plans if any part did not work well by observing and asking students their opinions after the lessons. Besides that, I will keep working on creating more lesson plans and activities for other math topics that could be used in a diversified classroom to help students learn better. In the future, when I develop the math curriculum, I hope to team up with educators who are teachers of color or have a strong background in working with students of color.

## Conclusion

This chapter summarizes my project reflection and my findings on *how math educators can create a culturally inclusive environment classroom to motivate students, especially students of color, in learning and participation*. I have always been passionate about exploring novel ways to foster my student's interest in mathematics and its ubiquity in their daily lives. I have started realizing more when teaching at my current charter school that every student is different and every student deserves to be kept in mind while planning, instructing, and assessing. Throughout this journey, it has taught me to be my own researcher at times and to professionally learn from my colleagues on their experience and wise advice. It also has expanded my knowledge in researching more articles, blogs, and books to see the best teaching practices out there in order to help me make my lessons more engaging. Looking to the future, my hope is that this capstone paper and project could be helpful and motivational for other math educators who are also looking for the ways to improve their classroom to be more culturally inclusive.

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